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'Secondary' Measures of Business Economic
Performance: An Attempt at Methodological
Triangulation

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Measures of Business Economic Performance:
An Attempt at Methodological Triangulation

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Abstract

This study is an attempt at assessing method convergence between two different operationalizations of Business Economic Performance--viz., managers' assessment of their organization's relative performance and secondary analysis based on published sources. An evaluation of the convergence of three indicators of performance--sales growth, profit growth, and ROI--provided strong results, indicating that managers are generally not biased in their assessments.

On the Correspondence Between 'Primary' and 'Secondary'
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Introduction

Concern with enhancing organizational performance is at the heart of most organizational research (Campbell, 1977; Chakravarthy, 1984; Ford & Schellenberg, 1982; Hofer, 1983; Kanter & Brinkerhoff, 1981; Kirchoff, 1977; Seashore & Yuchtman, 1967; Steers, 1975, 1977).

Perhaps more than any other branch of the organizational sciences, the field of strategic management is centrally focused on issues of organizational performance (Schendel & Hofer, 1979). A normative theory of strategic management awaits not only the clarification of the term "strategic performance," but also the development of reliable and valid approaches to the measurement of the performance construct.

Two major issues need to be addressed in dealing with the operationalization of performance construct. One pertains to the choice of an appropriate set of operational indicators reflecting the construct's domain, while the other is concerned with the method of data collection. The first issue is plagued with controversies and debates (see especially Campbell, 1977; Connolly, Conlon, & Deutsch, 1980; Goodman & Pennings, 1977; Hanna, Freeman, & Meyer, 1976; Steers, 1975; 1977), and we will have little to say on this here. In relation to the second issue researchers typically are faced with the choice of obtaining performance data either from 'secondary' sources--i.e., data collected from sources external to the organization, or from 'primary' sources--i.e., data collected from the organizations themselves. While operationalizations based on secondary data permit replicability, primary

data could introduce respondent bias and may not serve the interests of replicability. On the other hand, secondary data on performance may not be available at the desired level of detail for some applications (e.g., for an SBU-level focus).

Most researchers choose one of these approaches but seldom provide evidence of convergence with the other operationalization. Given that both approaches, when considered individually, may have questionable measurement properties, it is necessary to address the issue of "method convergence" (Campbell & Fiske, 1959) in operationalizing organizational performance to ensure that the variance reflected is that of trait and not of method. Such attempts reflect the philosophy underlying methodological triangulation (Denzin, 1978; Jick, 1979)--the use of complementary methods to enhance researcher's belief in results.

Thus, this study seeks to assess the extent of convergence in operationalizations of the construct of Business Economic Performance (BEP) by collecting data from two different methods--viz., primary data from organizations themselves, and secondary data from published sources, external to the organization. Such an approach reflects Campbell and Fiske's (1959) call for using 'maximally different' methods to assess convergent validity of operationalizations. As noted by Bouchard, convergence between two methods "enhances our belief that the results are valid and not a methodological artifact" (1976; p. 268). When maximally-differing methods are used, the approach is termed 'between-methods' triangulation (Denzin, 1978; Jick, 1979), which rests on the assumption that the two methods do not share the same weakness or potential bias (Rohner, 1977).

Thus, this research attempts a methodological triangulation of the correspondence between two different operationalizations of BEP--managers' assessment of their organization's relative competitive performance and secondary analysis of relative performance based on published sources.

Research Method

Indicators of BEP: Three indicators--viz., sales growth, net income growth, and return on investment (ROI)--were chosen to reflect BEP. These three indicators correspond to the key dimensions of performance distilled by Woo and Willard (1983) based on their analysis of PIMS data--viz., (i) profitability; (ii) relative market position; (iii) change in profitability, and (iv) growth in sales and market share. Hofer (1983) also found these indicators to be among the most commonly used measures of BEP. Hence, an examination of the method convergence of these indicators should be of interest to strategy researchers operationalizing business performance.

Primary measures: For each of the three indicators, managers were requested to indicate their positions, not of their absolute performance but their performance relative to their major competitors. This reflects the "relative" nature of the performance concept stressed by many, including the PIMS-based strategy studies. A five-point interval scale ranging from -2 (much worse than competition) to +2 (much better than competition) with the neutral point 0 indicating a level of performance equal to that of competition was employed. Data were collected from senior-level managers (either presidents/vice presidents of functional areas or vice presidents of corporate planning) as

a part of a larger project during February-May 1984. Although the larger project had a response rate of over 33% (207 out of 600), only 86 cases are used in this study. Since anonymity was to be ensured, the respondent's name, and corporate affiliation was voluntary. 86 respondents indicated their organizational affiliations which was necessary to collect secondary data on them. Table 1 lists some key characteristics of the sample employed in this study.

INSERT TABLE 1 ABOUT HERE

Secondary measures: For each of the three indicators, secondary measures were assembled from Business Week magazine's "Inflation Scorecard" for the year 1983, as reported in the March 21, 1984 issue. Business Week compiles these data from Standard & Poor's COMPUSTAT tapes, and was a convenient and easily accessible source of data. Relative performance was operationalized as "firm performance relative to industry"--where industry referred to the principal SIC industry classification in which the firm was normally placed. It was measured as the difference between the value of the indicator for the firm and the industry. For example, relative sales growth was the sales growth of the focal firm minus the sales growth of its primary industry.

Results

Table 2 presents the descriptive statistics as well as the analysis in the form of Campbell and Fiske's MultiTrait, MultiMethod (MTMM) matrix which is one of the analytical schemes of methodological triangulation. Entries in the MTMM matrix are Pearson's Zero-order correlations.

INSERT TABLE 2 ABOUT HERE

The first of the four criteria of an MTMM matrix (Campbell & Fiske, 1959) refers to convergent validity and requires that all the diagonal coefficients in the lower left quadrant of the matrix (termed, "validity coefficients") be "sufficiently large" and statistically significant (Campbell & Fiske, 1959). Table 2 indicates that all the three validity coefficients are greater than 0.4 and statistically significant at a p-level better than 0.01.

The other three criteria relate to discriminant validity, viz., whether the three traits are different from one another or not. While these criteria are not directly relevant for the attempt at checking for correspondence, they imply that measures of different concepts should share little common variance, since a high level of covariation casts doubt on the uniqueness of measures and/or the concepts. The second criterion requires that each validity coefficient should be larger than the "different trait-different method" correlations (which are in the same row or column as the validity coefficients in the dashed triangles adjacent to the validity coefficient). As shown in Table 2, this condition is satisfied in all three cases.

The third criterion requires that each validity coefficient should be larger than the "different trait-same method" correlations (which involve the same variable as that of the validity coefficient in the lower right and upper left quadrants). This condition is satisfied in two of the four cases for the sales growth measure, in one out of the four cases for the profit growth measure, and in three out of the four

cases for the ROI measure. The general support for this criterion appears to be "moderate."

The fourth and final criterion requires that the pattern of correlations present in each of the four triangles (both solid and dashed) in the matrix should be similar. A test of this similarity can be accomplished by ranking the correlations in each triangle and deriving a measure of the rank correlation across the triangles. Friedman two-way test was conducted for this purpose. Its associated chi-squared statistic was 6.50 (df=2), statistically significant at a p value of 0.039. Thus, we conclude that the relative rankings of the correlations is preserved within the four triangles, thereby satisfying the fourth criterion.

Discussion

The results (especially, the first criterion of the MTMM matrix) indicate that there exists a strong degree of "method convergence" when performance data was obtained from two 'maximally different' methods. It appears that respondents tend to be less biased in their assessments of their organizational performance than researchers have tended to give them credit for. The main implication of our finding is that perceptual data from senior managers, which tend to correlate well with secondary data, can be employed as acceptable operationalizations of BEP.

A previous study by Dess and Robinson (1984), using self-reported 'objective' data and subjective assessments of two performance indicators--return on assets and sales growth, reported a close correspondence between the two operationalizations. Their two approaches

are conceptually similar in the sense of employing data collected from only primary source, and represent 'within-method' type of triangulation (Denzin, 1978). The limitations of this type of triangulation are noted by Denzin, "Observers delude themselves into believing that...different variations of the same method generate...distinct varieties of triangulated data. But the flaws that arise using one method remain...." (1978, pp. 301-302). In contrast, the present study, which reflects a 'between-method' type of triangulation rests on the assumption that the weaknesses in each single method will be compensated by the counterbalancing strengths of another. Thus, this study can be seen as a study which moves the operationalizations of BEP towards the 'between-methods' approach to triangulation, which "allows researchers to be more confident of their results" (Jick, 1979; p. 608).

Although the study established correspondence across two maximally different methods, a potential limitation of this study should be recognized. Data for this study were collected from a single respondent in each responding unit. Hence, the possibility of functional or response bias cannot be entirely ruled out. It would have been desirable to collect data from multiple managers within a unit so that inter-manager consistency could have been assessed. However, the size of the target population and resource limitations prompted us to trade off in favor of larger sample size rather than multiple responses per unit. Further, based on results obtained in earlier studies which have employed the "multiple respondent design" (e.g., Dess & Robinson, 1984; Snow & Hrebiniak, 1980) it can be argued that there is generally less variability within raters of a particular firm than raters across firms.

Moreover, respondents in our study were senior-level managers (e.g., vice president-strategic planning, president or functional vice president) who can be argued to be key members of the dominant coalition of the firm, and thus can be considered as "representatives" of the organization. Thus, while Dess and Robinson's study addressed the measurement theme of inter-judge reliability in performance assessment, this study focused on a different measurement issue, viz., convergence across "maximally different methods"--which is a key requirement for construct validity of measures (Campbell & Fiske, 1959). Nevertheless, the issue of using multiple-respondents to measure organizational-level constructs such as BEP needs to be addressed by strategy researchers.

The use of MTMM framework enabled us to address a related issue of "uniqueness" of the three traits considered for operationalizing BEP. The support received for the three criteria of discriminant validity imply that the three indicators considered here tap different "traits" of BEP. This is in agreement with the findings of Woo and Willard (1983)--who employed a different data-analytic framework (factor analysis) and a different data base (the PIMS program) in arguing for a multi-dimensional operationalization of performance. However, the results of this study should not be taken to indicate that these are the only dimensions. Nor is it implied by us that these are the key dimensions of organizational performance. Based on the results reported here and previous theoretical arguments (e.g., Campbell, 1977; Steers, 1975; 1977) and empirical results (e.g., Woo & Willard, 1983), we argue that the use of any single indicator (dimension) to capture the relatively complex construct of performance should be viewed with disfavor.

Extensions

Measurement of organizational performance in general, and BEP in particular is central to research in strategic management. Towards this end, Woo and Willard's (1983) study, Dess and Robinson's (1984) study and the results reported here are to be viewed as starting points for further refinement and extensions. Future research directions on performance measurement can be broadly grouped under three streams. One is to employ multiple managers chosen to represent different functional areas, hierarchical level, or length of tenure with the company, since these variables may have an impact on the ability of respondents to make complex judgments on assessing organizational performance. Given managers' differing frames-of-reference, such an analysis could provide interesting and useful pointers for the choice of respondents in the design of field studies. Two, since the domain of organizational performance extends beyond BEP, similar methodological triangulation attempts to assess convergence should be undertaken for broader conceptualizations of organizational performance which include both financial and operational indicators.

The third stream of extension relates to the issue of superiority of one operationalization over another. This is important since researchers examining convergence between methods to assess the quality of their operationalizations may elect to use one or the other, but not necessarily both. In this context, Dess and Robinson in concluding their study expressed their preference for 'objective' data by noting that subjective performance data are good substitutes

for objective data whenever "(1) accurate objective measures are unavailable, and (2) the alternative is to remove the consideration of performance from the research design" (1984, p. 271). This was not based on any specific analysis of the superiority of one method over another, but merely reflects their note of caution. It should prove useful to systematically assess the relative superiority of one method over another, by analytical approaches such as the analysis of covariance structures (Jöreskog & Sorbom, 1979), which provides a basis to decompose the variance in measurement into key components such as trait, method, and random error.

Strategy researchers in particular need to take cognizance of these conceptual and measurement issues in view of the embryonic nature of their field. Although a paradigm of strategic management is at hand (Schendel & Hofer, 1979), a normative theory of strategic management cannot be developed unless the crucial issues of conceptualizing and measuring organizational performance are more fully researched and understood.

Summary

Data on three commonly employed indicators of performance--sales growth, profit growth, and ROI--were collected by two different methods--(i) perceptual assessments by senior executives and (ii) secondary data sources. An evaluation of their convergence provided positive results, indicating that managers are generally not biased in their assessments of organizational performance. In addition, it was observed that those indicators tap different traits of performance, thus raising some important measurement issues in relation to the dimensionality of organizational performance.

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Table 1

Key Characteristics of the Sample (n=86)

1. Sales level

\$ 50 - 100 Million	2.4 ^a
\$101 - 250 Million	2.4
\$251 - 500 Million	4.7
\$501 Million - \$ 1 Billion	4.7
over \$ 1 Billion	85.9

2. Industry Category

Consumer Goods	21.2
Capital Goods	31.8
Raw or semi-finished materials	22.4
Components for finished goods	12.9
Service	11.8

3. Respondent's Responsibility

Staff responsibility (e.g., V.P. - Strategic Planning)	79.1
Operating responsibility (e.g., President or Functional V.P.s)	20.9

^aAll figures are percentages. Non-responses are excluded in the percentage calculations.

Table 2

Primary Versus Secondary Measures of
Business Economic Performance: An MTMM Analysis

	PRIMARY			SECONDARY			DESCRIPTIVE STATISTICS	
	SG ^a	PG	ROI	SG	PG	ROI	MEAN ^b	SD
Primary	SG	1.00					3.32	0.91
	PG	0.47	1.00				3.47	1.05
	ROI	0.36	0.74	1.00			3.24	1.06
Secondary	SG	0.44	0.24	0.15	1.00		1.13	12.54
	PG	0.32	0.42	0.33	0.69	1.00	(-)2.64	21.71
	ROI	0.10	0.36	0.51	0.02	0.28	1.00	(-)0.54

Convergent Validity: Criterion 1

All validity coefficients (SG: 0.44; PG: 0.42; ROI: 0.51) are statistically significant at $p < 0.01$.

Discriminant Validity: Criteria 2 and 3

Validity Coefficient	Criterion 2 % satisfied	Criterion 3 % satisfied
0.44	100	50
0.42	100	25
0.51	100	75

Criterion 4:

Chi-squared statistic for Friedman's non-parametric test for the rankings of the correlations within the four triangles: 6.50 (df=2), statistically significant at $p = 0.039$.

^a SG: Sales growth; PG: Profit (net income) growth; ROI: Return on Investment. Entries in the matrix are Pearson's zero-order correlations.

^b Primary data are based on five-point Likert-type scale, secondary data are actual values.

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